

ABSTRACT

A matching network hybrid electro-magnetic compatibility (EMC) absorber. A substrate of any number of materials serves as the frame on which partial coatings are placed. Design parameters governing the substrate and other parameters governing the coating control the electrical properties of the matching network hybrid EMC absorber. By performing partial and/or full coating, the physical shape and mechanical properties of the matching network hybrid EMC absorber may be de-coupled from the electrical properties. A designer modifies and controls the electrical performance of an electro-magnetic test system by special-tailoring a matching network hybrid EMC absorber. An electro-magnetic wave to ensure that a majority of the electro-magnetic wave is absorbed into a lossy, absorber material mounted on the walls of a test chamber in the frequency range from 20-500 MHz. Typically, the absorber material includes ferrite tiles, and the present invention ensures that a majority of the electro-magnetic illumination within a test chamber is properly absorbed by these ferrite tiles. The matching network hybrid EMC absorber operates as a broadband matching network at a low frequency range. Using of a computer model and numerical optimization, the lossy films of the matching network can also be designed so that it absorbs majority of the RF energy before it reaches the flat surface of ferrite tile in the frequency range of 500 MHz to 40 GHz. The combined design method presents a new cost effective method to manufacture hybrid EMC absorbers in a extremely broadband frequency range from 20 MHz to 40 GHz.

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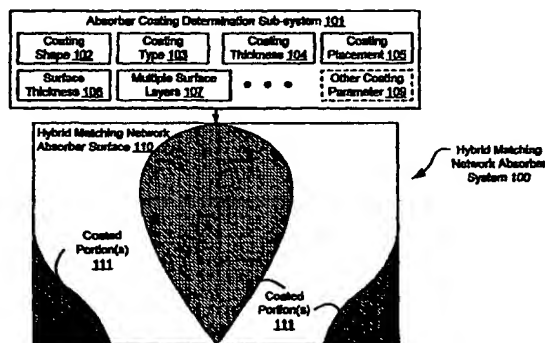
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(57) Abstract: A matching network hybrid electro-magnetic compatibility (EMC) absorber. A substrate of any number of materials serves as the frame on which partial coatings are placed. Design parameters governing the substrate and other parameters governing the coating control the electrical properties of the matching network hybrid EMC absorber. By performing partial and/or full coating, the physical shape and mechanical properties of the matching network hybrid EMC absorber may be de-coupled from the electrical properties. A designer modifies and controls the electrical performance of an electro-magnetic test system by special-tailoring a matching network hybrid EMC absorber. An electro-magnetic wave to ensure that a majority of the electro-magnetic wave is absorbed into a lossy, absorber material mounted on the walls of a test chamber in the frequency range from 20-500 MHz. Typically, the absorber material includes ferrite tiles, and the present invention ensures that a majority of the electro-magnetic illumination within a test chamber is properly absorbed by these ferrite tiles. The matching network hybrid EMC absorber operates as a broadband matching network at a low frequency range. Using of a computer model and numerical optimization, the lossy films of the matching network can also be designed so that it absorbs majority of the RF energy before it reaches the flat surface of ferrite tile in the frequency range of 500 MHz to 40 GHz. The combined design method presents a new cost effective method to manufacture hybrid EMC absorbers in a extremely broadband frequency range from 20 MHz to 40 GHz.

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